

EXHIBIT A

IMPROVING FEDERAL PROCUREMENT:
THE BENEFITS OF VENDOR-NEUTRAL CONTRACT SPECIFICATIONS

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Summary of Findings

My name is Preston McAfee and I am the J. Stanley Johnson Professor of Business, Economics and Management at the California Institute of Technology. I have been asked by Advanced Micro Devices, Inc. ("AMD") to examine federal procurements of computer hardware. In particular, I have been asked to address the question of whether procurement solicitations for computer hardware (such as laptops, desktops, and servers) that use brand name specifications harm competition and the interests of U.S. taxpayers. In addition, I was asked to provide an estimate of savings that federal agencies and the U.S. Treasury likely would realize if such exclusionary language were eliminated.

The following is a summary of the primary findings of my study.

1. The Federal Acquisition Regulation (FAR) prohibits the use of brand name requirements except under special circumstances.¹ Despite this restriction, many federal agencies fail to comply by regularly using brand name specifications in their procurements of expensive computers and other products. Exclusionary language used in procurement contracts restrains competition, leading to higher prices and harm to U.S. taxpayers

2. Eliminating Brand-Name Specifications Would Save Taxpayers Hundreds of Millions of Dollars

Economic analysis shows that the federal government and U.S. taxpayers likely would save approximately \$281 million to \$563 million in present value savings by adopting vendor-neutral contract specifications.

3. Evidence of Brand-Name Specifications in Government Solicitations for Computers Hardware is Abundant and 69 Percent of Applicable Solicitations in 2004 Contained Language Specifying Brand Name Microprocessors

- In 2004, approximately 69 percent of computer hardware solicitations posted on the U.S. Government's online procurement notification service contained language that either specifically required brand name microprocessors or specified that the microprocessor should be equivalent to a brand name microprocessor.
- Until 2005, the United States Air Force required computers purchased through the agency's commodity purchasing program to include Intel microprocessors. They have since modified their policy and this study reveals that full competition for competing microprocessors could save the Air Force and taxpayers approximately \$2.2 million each year.
- In April of 2005, the U.S. Office of Management and Budget (OMB) recognized the pervasive problem of brand-name specifications for computers and other government purchases and issued a directive to federal agencies to comply with existing restrictions for brand-name specifications and use neutral specifications for future purchases.²

4. Current Federal Procurement Regulations regarding the use of Brand-Names Encourage Bias and Abuse

¹ Federal Acquisition Regulation, Part 11.105

² Executive Office of the President, Office of Management and Budget, David H. Safavain and Karen S. Evans (April 11, 2005), Memorandum for Chief Acquisition Officers, Chief Information Officers, and Senior Procurement Executives, *Use of Brand Name Specifications*.

- Under certain conditions, current federal regulations allow the use of the phrase “brand-name or equal” for procurement specifications. The same regulations, however, state that performance specifications are preferred to encourage vendors to offer innovative solutions.³ Unfortunately, many federal agencies routinely use the “brand-name or equal” clause to describe microprocessors in procurements of computing products. This non-competitive practice is inherently biased against non-name-brand product offerings and encourages purchasing decisions based on brand-name recognition and perception instead of objective performance measures.

5. Many Government Purchases Lack Process Transparency and Accountability

- Many government purchases are made through ordering processes under Indefinite Delivery/Indefinite Quantity contracts (ID/IQ), Government Wide Acquisitions (GWAC) vehicles, and the General Services Administration’s Federal Supply Schedules (FSS) that are not routinely posted on FedBizOps, making it difficult to track these transactions and raising questions about the transparency and public accountability of purchases made through these mechanisms.

Recommendation: The U.S. Government Needs Stronger Enforcement and Regulations to Ensure Competition

- Brand-name specifications in government contracts for computer hardware inhibits competition in the market for microprocessors, leading to higher prices and less variety, thereby hurting government agencies and American taxpayers. To ensure price and performance competition, the government should improve enforcement of existing restrictions for brand-name specifications and enact stronger regulations requiring the use of objective, third-party benchmarking criteria for specifications involving highly technical products such as microprocessors.

³ 11.104(a) Federal Acquisition Regulation (FAR)

I. COMPETITION REDUCES PRICES AND INCREASES WELFARE

Market competition is the mechanism used in our society to allocate scarce resources among many competing needs. Economists agree that enhancing competition in a market improves economic welfare.⁴ Competition puts pressure on firms to create and offer better value to customers. As a result, consumers benefit because they have access to a greater supply of higher-quality products, available at lower prices.

As a general rule, then, free competition based “on the merits” should determine which firms ultimately produce the goods and services demanded by consumers. However, departures from this principle may be justified in certain cases. For example, when a very large firm dominates a market, a handicapping system that would encourage competition by smaller firms could be justified.

II. EXCLUSIONARY LANGUAGE USED IN PROCUREMENT CONTRACTS RESTRAINS COMPETITION, LEADING TO HIGHER PRICES AND HARM TO U.S. TAXPAYERS

Procurement specifications necessarily restrict competition. By providing a detailed description of the item to be acquired, a procurement specification effectively narrows down the set of available choices. However, not all specifications are exclusionary, in the sense of artificially or unnecessarily restricting competition. Some specifications are necessary to ensure that the relevant set of alternatives comply with certain quality requirements or adequately serve the performance and functional needs of the buyer. Exclusionary specifications by definition do not serve any useful purpose; they unnecessarily reduce the set of alternative suppliers, and they constitute artificial restrictions to competition. Anticompetitive procurement language increases prices and reduces quantities, product variety, and quality.

Competition in federal procurements is limited by the use of anticompetitive specifications like “brand name or equal,” leading to higher prices for federal agencies and American taxpayers. For these reasons, the

⁴ Economists measure economic welfare as the sum of “consumers’ surplus” and “producers’ surplus.” Consumers’ surplus equals the dollar value of the difference between (1) the dollar value of what consumers would be willing to pay to acquire a good minus (2) the price they actually pay. Producers’ surplus equals (1) the total revenue received by producers for making a given quantity of a product minus (2) the minimum revenue they would accept to produce that quantity of the product (i.e., their cost).

Federal Acquisition Regulation (FAR) states that “agency requirements shall not be written so as to require a particular brand name, product, or feature of a product, peculiar to one manufacturer, thereby precluding consideration of a product manufactured by another company. . . .”⁵ However, despite this express language, some federal agencies continue to use brand name specifications in their procurements.

When exclusionary specifications are imposed unnecessarily, incentive problems for both prospective buyers and sellers arise. On the demand side, government procurement officers have little incentive to select the non-brand name product, when the procurement language specifies use of a brand name product or its “equivalent.” In such a circumstance, the safe, low-risk choice for a government procurement officer is to select the brand name product, a decision best illustrated by the old advertisement: “Nobody ever got fired for buying IBM.”⁶

The “brand name or equal” requirement forces suppliers of “equivalent” products to demonstrate their products are equivalent to the brand name product, while vendors of the brand name product are free of that burden. Those vendors capable of supplying both the brand name product and its non-brand name equivalent find it easier to offer the former, avoiding the cost of showing that the alternatives are actually equivalent to the brand name item. Thus, the specification of “brand name or equal” biases the competition in favor of the brand name in two ways: first by encouraging procurement officers to select the brand name rather than verify that the alternative product is indeed equivalent, and second by encouraging suppliers to favor the brand name product.

In response to this continued practice, the Office of Management and Budget (“OMB”) has issued a memorandum to Chief Acquisition Officers, Chief Information Officers, and Senior Procurement Executives throughout the federal government.

⁵ *Federal Acquisition Regulation*, issued jointly by the U.S. General Services Administration, the U.S. Department of Defense, and the U.S. National Aeronautics and Space Administration, March 2005, at 11.105.

⁶ See R. Preston McAfee, *Competitive Solutions: The Strategist's Toolkit*, Princeton University Press, 2003.

OMB's memorandum states:

We are concerned the use of brand name specifications in agency solicitations may have increased significantly in recent years, particularly for information technology procurements. For example, some Federal agencies have issued solicitations with specifications for brand name microprocessors associated with a single manufacturer. Rather than issue brand name specifications for microprocessors, agencies should either: (1) articulate a benchmark of performance; or (2) specify the requirements for applications and interoperability. . . . [T]he use of brand name specifications limited competition and diminished the likelihood the agency purchased the best value product.⁷

The federal government's concern with its procurement practices also was emphasized in a Government Accountability Office study last year.⁸ This study found that the federal agencies purchasing products through the General Services Administration's multiple award schedules program did not follow certain operating procedures required to ensure the government receives the lowest prices available under its schedule programs.

In addition to adverse effects on prices paid by federal agencies, the use of brand name specifications can reduce the variety of products available for purchase. In the case of microprocessors, for example, there are only two significant producers: Intel and AMD. When a brand name specification has the effect of eliminating AMD, buyers in federal agencies have their choices reduced to a single firm's products. Although the microprocessors manufactured by Intel and AMD are sufficiently similar that valid price comparisons can be made for comparable models (see below), the firms' products are not identical. Since the federal government purchases computers for widely varying uses, there are circumstances where one firm's microprocessors have advantages over the other firm's microprocessors. However, federal procurement officers cannot choose the product that best fits their demands when brand name specifications prevent AMD's microprocessors from even being considered. Further, because brand names do not provide an accurate measure or definition of product performance, basing decisions on brand names places at risk the quality and suitability of government purchases.

⁷ Executive Office of the President, Office of Management and Budget, David H. Safavain and Karen S. Evans (April 11, 2005), Memorandum for Chief Acquisition Officers, Chief Information Officers, and Senior Procurement Executives, *Use of Brand Name Specifications*.

⁸ General Accounting Office, "Contract Management: Opportunities to Improve Pricing of GSA Multiple Award Schedules Contracts," February 2005.

Specifications Should be Based on Performance Measures such as Objective Benchmarks from Standard Third-Party Benchmarking Organizations

No efficiency reason exists to justify the use of exclusionary language in public procurements.⁹ In some circumstances, the variety and complexity of items along with a lack of consistent benchmarks could compel contracting agents to use brand names rather than to detail specific technical requirements and product characteristics. In the case of microprocessors, however, third-party benchmarks represent a solution to such procurement specification problems. The use of microprocessor benchmark scores in computer contract solicitations appropriately emphasizes the necessary physical, functional, and performance characteristics of these items while remaining brand neutral and objective. In contrast, procurement language based solely on microprocessor brand name, or specific features such as clock speed, may be misleading, since they do not accurately reflect the desired performance target. In fact, the performance of a microprocessor with a fast clock-speed may be adversely affected by other components in the motherboard, such as RAM memory, for example, and by the set of software applications with which it is expected to interact. Such considerations will be overlooked by procurement specifications based on brand names or clock-speeds; rather, requirements should be based on more comprehensive measures of performance appropriate to the tasks for which the computer is intended to be used.

Fortunately, and as alluded to in the OMB memorandum, there are independent testing organizations that produce application-based benchmarks. An example is PC WorldBench, a firm that provides rigorous performance testing and benchmarking services. Similarly, BAPco is a non-profit consortium whose “charter is to develop and distribute a set of objective performance benchmarks based on popular computer applications and industry standard operating systems.”¹⁰ Both AMD and Intel are members of BAPco, along with a host of other computer hardware and software manufacturers.

⁹ In some circumstances, a buyer such as the federal government can minimize its expected procurement costs by discriminating in favor of certain bidders, e.g., by providing price preferences to a given group of bidders. See R. Preston McAfee and John McMillan (1989), *Government Procurement and International Trade*, JOURNAL OF INTERNATIONAL ECONOMICS, vol. 26, pp. 291-308. The circumstances required for discrimination to be an optimal policy for a buyer are not present in the current matter, or would suggest discriminating in favor of AMD.

¹⁰ <http://www.bapco.com/about.html>.

PC WorldBench, BAPco SYSmark, and other independent parties have established rigorous testing procedures for benchmarking the performance level of computer microprocessors. The standards being set by qualified benchmarking firms and industry-standard consortiums have gained wide acceptance within the consumer electronics and semiconductor industries. The independent nature of the benchmarking firms alleviates concern over preferential treatment of particular manufacturers and opens government agencies to the benefits of competition in product price and quality.

Further, benchmarks standardize the often complex and diverse language surrounding technology products. Specifying in contracts the required performance level of a unit, rather than naming a particular brand, enables government agencies to communicate in simple terms the exact quality standards of a needed item. The use of a benchmark score also simplifies for contracting agencies the task of comparing product performance. In particular, one benchmarking strategy is to measure the performance of computer systems as they respond to the demands of actual software applications. Such application-based evaluations are highly applicable to the performance concerns of government agencies, which are often related to a processor's ability to perform tasks on specific applications. For example, PC WorldBench "uses real applications running real-world tasks to assess a PC's overall processing speed."¹¹ In terms of simplicity, articulating a set of relevant benchmark values is superior to the requirements associated with naming a specific microprocessor brand name or product. The FAR requires that "[b]rand name or equal purchase descriptions must include, in addition to the brand name, a general description of those salient physical, functional, or performance characteristics of the brand name item that an 'equal' item must meet to be acceptable for award."¹² Moreover, last year, the OMB stepped up the requirements associated with requesting specific brand names, asking agencies to publicly post justification for the use of a brand name in a contract solicitation. Benchmark specifications eliminate the need for these efforts, as the product characteristics are quantified by the benchmark score.

¹¹ <http://www.pcworld.com/reviews/article/0,aid,32801,00.asp>

¹² *Federal Acquisition Regulation*, issued jointly by the U.S. General Services Administration, the U.S. Department of Defense, and the U.S. National Aeronautics and Space Administration, March 2005, at 11.104.

Performance Based Specifications Promote Competition, Innovation, and Cost Savings

In summary, when government contracts request brand names, this inhibits competition in the market for processors, leading to higher prices for computer equipment and less variety, thereby hurting government agencies and American taxpayers. As there is no efficiency or pro-competitive case in favor of using such exclusionary language, these restrictions are unnecessary and should be eliminated. A likely outcome of such modification will be a reduction in prices, significant cost savings for government agencies and the US Treasury, an increased product variety and a more efficient allocation of resources.

III. EVIDENCE OF EXCLUSIONARY LANGUAGE IN GOVERNMENT PROCUREMENT CONTRACTS

My staff and I reviewed approximately 2,500 government contract solicitations for computer equipment tendered during the period July 2003 – March 2005. During the calendar year of 2004, I found that approximately 69 percent of the applicable solicitations posted on the federal online service, *FedBizOpps.gov*, contained language that either required the use of brand name microprocessors or specified that the processor should be equivalent to a brand name microprocessor. Here are several examples of the use of brand name specifications in the contract solicitations.¹³

- Solicitation No. 3951

This presolicitation notice (posted on December 23, 2004) was for the purchase of up to 95 servers. The notice stated “the following specifications are required for all servers: 1 gigabyte of RAM 2U form factor case *Intel processor* with at least 2.8 Mhz or better Front side bus speed of 833 Mhz. . . .”¹⁴

¹³ I also have found a small number of instances of exclusionary language favoring AMD:

- Solicitation No. F5346A41880200, specifying an AMD Opteron processor;
- Solicitation No. FA8604-04-R-3032, specifying an AMD Opteron processor; and
- Solicitation N0017805Q1122, specifying an AMD Athlon processor.

For all the reasons set forth in this report, such non-vendor neutral contract specifications should be avoided.

¹⁴ <http://www2.eps.gov/servlet/Documents/R/1074037> (emphasis added).

- Solicitation No. W9124Q-05-R-EGADP

This combined solicitation (posted on December 28, 2004) was for laptop computers. The notice stated: “(No Substitutes): 2 each, Dell Precision Workstation 360 to include *Intel Pentium 4 Processor 2.80GHz*. . . .”¹⁵

- Solicitation No. W9124Q-05-R-EPGCLE

Combined solicitation posted on January 6, 2005 for laptop computers. The notice stated: “requirement: 3 each, Dell Precision M60, *Pentium M Processor 765*. . . .”¹⁶

- Solicitation No. N00 1189-05-T-0208

This presolicitation notice posted on March 21, 2005 for the purchase of 48 desktop computers. The solicitation stated: “with components as listed . . . CPU002441-00 Processor *Intel Pentium 4 Processor 3.20E GHz*. . . .”¹⁷

- Solicitation No. DTFAAC-04-R-01055

Posted on May 14, 2004, this is a “Sources Sought” notice for the purchase of 244 desktop computers. The notice stated: “Requirement specifications . . . 2.8 GHz, *Intel Pentium 4* . . . NO SUBSTITUTION OF THE ABOVE STATED MINIMUMS WILL BE CONSIDERED. . . .”¹⁸

In other instances, the requirements did not instruct buyers to exactly match a specific type of Intel processor, but rather the specification language featured expressions such as, for example: “Intel Pentium III or equivalent” or “Must meet or exceed the following salient characteristics: Intel Pentium 4 3.2 Ghz.” Although such specifications do not explicitly bar non-Intel microprocessors, alternative CPU suppliers are clearly in a

¹⁵ <http://www1.eps.gov/servlet/Documents/R/1074921> (emphasis added).

¹⁶ <http://www1.eps.gov/servlet/Documents/R/1079093> (emphasis added).

¹⁷ <http://www1.eps.gov/servlet/Documents/R/1137735> (emphasis added).

¹⁸ <http://www1.eps.gov/spg/DOT/FAA/HQ/DTFAAC%2D04%2DR%2D01055/SynopsisR.html> (emphasis added).

disadvantageous position vis-à-vis Intel. As discussed above, procurement officials have little incentive to select the non-Intel microprocessor: that is, their low-risk choice is to select the brand name product. Also, vendors have an incentive to offer the Intel processor, rather than incurring the cost of showing that a non-Intel product is “equivalent” to the Intel processor mentioned in the specifications. Thus, to the extent that the Intel brand name is explicitly mentioned in the requirements while no mention of alternative suppliers is made, it unfairly discriminates against Intel rivals. Examples of government contract solicitations of this sort included the following:

- Solicitation No. DCAA-C04-106-001

In a “Sources Sought” notice (posted May 13, 2004) for the purchase of 39 servers, the following statement appears: “servers shall meet the minimum specifications provided below . . . *Intel P4 Processor 2.4 GHz . . . Intel Xeon 3.2 GHz . . . Intel Xeon 2.5 GHz . . . Intel Xeon 3.2 GHz . . .*”¹⁹

- Solicitation No. FERC05C50125

Posted on December 2, 2004, this was a combined solicitation for the purchase of a Disaster Recovery Facility with “[a]t a minimum two domain controllers will be required with the following specifications: *Intel Single 2.7 GHz . . .*”²⁰

- Solicitation No. 024-M-APHIS-05

This presolicitation notice, posted on December 21, 2004, involved 30 to 50 High Volume Classing Instrument Systems with “minimum information technology standards for new HVI systems. Any deviation from these standards must be submitted as a waiver request and must be approved by the USDA, AMS, Cotton

¹⁹ <http://www1.epa.gov/servlet/Documents/R/318728> (emphasis added).

²⁰ <http://www1.epa.gov/servlet/Documents/R/379954> (emphasis added).

Program. The minimum Information Technology Standards for HVI system includes: MS Windows XP Professional Operating System; *Intel Pentium IV* (minimum 2.8 ghz) processor. . . .”²¹

- Solicitation No. 516-032-05

This combined solicitation was posted on January 28, 2005 for the purchase of a Computerized Vascular Lab System. The specification language states that the requires that the “VA Medical Center, Bay Pines, FL, is seeking a contractor to provide a *brand name or equal* for the following equipment . . . *Pentium IV* 1.8 GHz. . . .”²²

It is important to note that this study reviewed only those federal government procurement solicitations that were posted on the federal online procurement notice website, FedBizOpps.gov. A substantial number of federal purchases are not listed on FedBizOpps.gov and therefore are not readily available to the public, raising questions about the public accountability for those purchases. For example, government purchases that are less than \$25,000 that are not required to be posted on FedBizOpps.gov and can be directly made through existing ID/IQ, GWAC or GSA Federal Supply Schedule (FSS) contracts. These types of purchases are not required to be posted publicly and information about the product specifications and purchasing criteria an agency may use in such a purchase is not readily available to the public, although it may be available upon request or through a Freedom of Information Act request. Furthermore, these purchasing mechanisms do not appear to have accountability or enforcement mechanisms in place to ensure compliance with the FAR prohibition on the use of brand-name specifications. In fact, the GSA FSS may actually encourage agency officials to make purchasing decisions based on brand names since products admitted to the FSS are listed by brand name and not by product performance.

²¹ <http://www1.eps.gov/servlet/Documents/R/382060> (emphasis added).

²² <http://www1.eps.gov/servlet/Documents/R/1095285> (emphasis added).

This situation is of particular concern because, according to an article last year in VARBusiness, “The General Services Administration (GSA) reported that spending on GSA Schedule contracts for IT products and services exceeded \$15 billion in fiscal year 2003. Based on that figure, the GSA Schedule contracts account for a full one-third of external IT spending by the federal government.”²³ Clearly, the GSA FSS is an important purchasing tool for government agencies and can assist agencies in reducing administrative costs associated with purchasing by effectively screening products and vendors who are capable of supplying the federal government with products that meet minimum standards. However, the lack of readily available public information regarding these purchases, particularly the criteria used by agency personnel to select a particular good or service, is cause for concern and should be reviewed by federal procurement authorities.

IV. ELIMINATING EXCLUSIONARY LANGUAGE WOULD SAVE U.S. TAXPAYERS HUNDREDS OF MILLIONS OF DOLLARS

In this section, I estimate the cost savings that government agencies and U.S. taxpayers likely would realize if the anticompetitive, exclusionary brand name specifications were eliminated. The computation is carried out in the following steps:

Step 1: Compute the number of hardware units purchased by the U.S. government in a given year. I first collected data on total government spending on three computer hardware categories (desktop, mobile, and server) for 2004. To estimate the number of units of each type of computer, I divided the dollar values spent on each type by an estimate of the average selling prices (“ASPs”) for the three hardware categories. The results are reported in Tables 1 and 2 below. Table 1 gives the likely savings discounted at the present prime interest rate of 6%, and Table 2 gives the likely savings discounted at the federal funds rate of 3%.

Step 2: Estimate the percentage of all contracts that contain brand name specifications. I used information compiled by the U.S. federal government in the FedBizOpps.gov website, which “is the single

²³ Patyon Smith, *GSA IT Spending Reaches Billions*, VARBusiness (April, 1, 2004)

government point-of-entry (GPE) for Federal government procurement opportunities over \$25,000.”²⁴ Based on all relevant solicitations with Classification Code 70 (“General Purpose Information Technology Equipment”) for the year 2004, I estimated that 69% of the solicitations contain exclusionary, brand name specifications. Applying this percentage to the total number of procurements computed in Step 1 results in an estimate of the number of procurements containing anti-competitive language (see Tables 1 and 2).²⁵

Step 3: Compute likely savings. The likely savings for a given type of computer hardware equal (1) the ASP for Intel microprocessors minus (2) the ASP for comparable AMD microprocessors, multiplied by (3) the number of hardware units procured with exclusionary language that AMD likely would capture but for the exclusionary language. The number of hardware units allocated to AMD is obtained by applying conservative estimates of AMD’s market shares in the U.S. consumer market for desktop (33%) and mobile computers (13%) and AMD’s market shares in the worldwide market for servers (6.5%) to the total number of units procured with exclusionary language.²⁶ Finally, the present value of these savings is computed by discounting the annual savings at the current prime interest rate (see Table 1), and the federal funds rate (see Table 2). The annual savings are assumed to continue in perpetuity. This assumption is appropriate since if an agency stops using brand name specifications in favor of vendor-neutral specifications (as required by the recent OMB directive cited above), the agency would be expected to maintain that policy.

In sum, my analysis shows that the federal government and U.S. taxpayers likely would save approximately \$281 million to \$563 million in present value savings by adopting vendor-neutral contract specifications. Given the minimal costs of such a policy, my recommendation is that, absent some

²⁴ <http://www.eps.gov>.

²⁵ As an alternative, one could estimate the percentage of desktop computers, mobile computers, and servers purchased in procurements having exclusionary, brand name specifications.

²⁶ Market shares estimates based on the following sources: Current Analysis’s U.S. retail desktop sales by CPU manufacturer as reported in “PCs: AMD desktops outsell Intel desktops 54% to 45%,” ITfacts.biz and Current Analysis’s U.S. Retail Notebook Sales by CPU Manufacturer as reported in “AMD: Barely an Underdog,” BusinessWeek, May 19, 2004. Current Analysis’s figures only capture retail desktop and mobile sales, so they do not include corporate purchases or direct sales such as those by Dell. Since Dell’s estimated share of the desktop market equals approximately 33% and Dell does not use AMD microprocessors, applying a 50% market share for AMD to the remaining 67% of desktop sales yields an estimate of 33% for AMD’s share of microprocessor sales for desktop computers in the U.S. AMD market share in the worldwide market for servers from IDC as reported in “AMD faces challenge of turning performance into sales,” Cox News Service, May 2, 2005; IDC’s 2004 US PC Shipments as reported in “Dell expands lead in still-growing PC market,” CNET News.com, Jan. 18, 2005.

extraordinary reason for specifying a particular brand name product, federal procurements should be vendor neutral and use standard third-party benchmarking criteria to specify the type of hardware sought for purchase.

EXAMPLE: *Improved Competition for Microprocessors can save the U.S. Air Force Tens of Millions of Dollars*

Several large U.S. government bodies utilize the exclusionary language outlined elsewhere in this report. For example, until last year the United States Air Force's (USAF) commodity purchasing program *solely* purchased Intel products, and specified this requirement in all of their procurement materials. Not only was this anti-competitive practice not in compliance with the FAR, but as one of the federal government's largest consumers of computing products the agency was potentially wasting millions of dollars due to the lack of competition. An additional concern was the USAF's use of Blanket Purchase Agreements ("BPAs"), under which the agency contracts with one business to supply not only its current requirements, but also its future requirements for the specified product for up to five years. In a recent request for proposals from small business OEMs, the USAF estimated that "the total volume of purchases through the small business BPA(s) will have an aggregate value of \$100M over 5 years."²⁷ In issuing such a purchase agreement, the agency would not only discriminate in their current procurements, but in future procurements as well.

Last year the USAF made a substantial effort to improve competition between competing microprocessor products. As a result, the agency is likely to reap substantial cost savings along with the potential for improved product performance and future innovation. In fact, based on the assumptions of this study, full competition for competing microprocessor products could save the USAF and taxpayers approximately \$2.2 million per year, with a present value of between \$36.7 and \$73.4 million, assuming that the USAF's planned hardware refreshes take place as scheduled (see Table 3). While this amount is relatively small in comparison to the USAF information technology budget, it is not insignificant.

²⁷ Department of the Air Force, Headquarters Standard Systems Group (SSG), Maxwell Air Force Base Gunter Annex Alabama, "Memorandum for BPA Invitee," September 21, 2004.

TABLE 1 – EXPECTED TAXPAYER SAVINGS
(DISCOUNTED AT THE PRIME INTEREST RATE OF 6.0%)

Type	U.S. Government Hardware Spending 2004 ¹	ASP ²	Number of Units	Units Procured with Anti-Competitive Language ³	Units Procured with Anti-Competitive Language Captured by AMD ⁴	Intel ASP ⁵	AMD ASP ⁵	Annual Expected Savings	Present Value of Expected Savings ⁶
Desktop	\$1,436,861,000	\$1,022	1,405,931	970,092	320,130	\$115	\$74	\$13,125,346	\$218,755,761
Mobile	\$475,155,000	\$1,378	344,815	237,922	30,930	\$182	\$68	\$3,526,009	\$58,766,812
Server	\$780,000,000	\$5,943	131,247	90,560	5,886	\$519	\$481	\$223,684	\$3,728,067
Total	\$2,692,016,000	N/A	1,881,992	1,298,575	356,947	N/A	N/A	\$16,875,038	\$281,250,639

1. Source: IDC Market Analysis, U.S. Federal Government IT Spending 2004-2007 Forecast (Updated 10-28-2005), Tables 4 and 5. U.S. Government spending on servers is restricted to servers with x86(64 bit) processors and x86(32 bit) processors.
2. Source: Derived from Gartner 4Q04 Quarterly Statistics. Includes monitor, keyboard, etc.
3. This number is calculated using a percentage for anti-competitive procurements of 69%, which was calculated from an analysis of all relevant synopses for the year of 2004 in Classification Code 70 – “General Purpose Information Technology Equipment.” Source: Federal Business Opportunities Website.
4. The market shares estimates are based on the following sources: Current Analysis’ US Retail Desktop Sales by CPU Manufacturer as reported in “PCs: AMD desktops outsell Intel desktops 54% to 45%,” ITfacts.biz and Current Analysis’s US Retail Notebook Sales by CPU Manufacturer as reported in “AMD: Barely an Underdog,” BusinessWeek, May 19, 2004. Current Analysis’s figures only capture retail desktop and mobile sales, so they do not include corporate purchases or direct sales such as those by Dell. Since Dell’s estimated share of the desktop market equals approximately 33% and Dell does not use AMD microprocessors, applying a 50% market share for AMD to the remaining 67% of desktop sales yields an estimate of 33% for AMD’s share of microprocessor sales for desktop computers in the U.S. AMD’s market share in the worldwide market for servers from IDC as reported in “AMD faces challenge of turning performance into sales,” Cox News Service, May 2, 2005; IDC’s 2004 US PC Shipments as reported in “Dell expands lead in still-growing PC market,” CNET News.com, Jan. 18, 2005.
5. Source: Mercury 4Q04 Aggregation, does not include monitors and keyboards.
6. Computed at the present prime interest rate of 6.0%.

TABLE 2 – EXPECTED TAXPAYER SAVINGS
(DISCOUNTED AT THE FEDERAL FUNDS RATE OF 3.0%)

Type	U.S. Government Hardware Spending 2004 ¹	ASP ²	Number of Units	Units Procured with Anti-Competitive Language ³	Units Procured with Anti-Competitive Language Captured by AMD ⁴	Intel ASP ⁵	AMD ASP ⁵	Annual Expected Savings	Present Value of Expected Savings ⁶
Desktop	\$1,436,861,000	\$1,022	1,405,931	970,092	320,130	\$115	\$74	\$13,125,346	\$437,511,521
Mobile	\$475,155,000	\$1,378	344,815	237,922	30,930	\$182	\$68	\$3,526,009	\$117,533,624
Server	\$780,000,000	\$5,943	131,247	90,560	5,886	\$519	\$481	\$223,684	\$7,456,133
Total	\$2,692,016,000	N/A	1,881,992	1,298,575	356,947	N/A	N/A	\$16,875,038	\$562,501,278

1. Source: IDC Market Analysis, U.S. Federal Government IT Spending 2004-2007 Forecast (Updated 10-28-2005), Tables 4 and 5. U.S. Government spending on servers is restricted to servers with x86(64 bit) processors and x86(32 bit) processors.
2. Source: Derived from Gartner 4Q04 Quarterly Statistics. Includes monitor, keyboard, etc.
3. This number is calculated using a percentage for anti-competitive procurements of 69%, which was calculated from an analysis of all relevant synopses for the year of 2004 in Classification Code 70 – “General Purpose Information Technology Equipment.” Source: Federal Business Opportunities Website.
4. The market shares estimates are based on the following sources: Current Analysis’ US Retail Desktop Sales by CPU Manufacturer as reported in “PCs: AMD desktops outsell Intel desktops 54% to 45%,” ITfacts.biz and Current Analysis’s US Retail Notebook Sales by CPU Manufacturer as reported in “AMD: Barely an Underdog,” BusinessWeek, May 19, 2004. Current Analysis’s figures only capture retail desktop and mobile sales, so they do not include corporate purchases or direct sales such as those by Dell. Since Dell’s estimated share of the desktop market equals approximately 33% and Dell does not use AMD microprocessors, applying a 50% market share for AMD to the remaining 67% of desktop sales yields an estimate of 33% for AMD’s share of microprocessor sales for desktop computers in the U.S. AMD’s market share in the worldwide market for servers from IDC as reported in “AMD faces challenge of turning performance into sales,” Cox News Service, May 2, 2005; IDC’s 2004 US PC Shipments as reported in “Dell expands lead in still-growing PC market,” CNET News.com, Jan. 18, 2005.
5. Source: Mercury 4Q04 Aggregation, does not include monitors and keyboards.
6. Computed with the federal funds rate of 3%.

TABLE 3 – EXPECTED MILITARY AGENCY SAVINGS

Type	Number of Units ¹	Units Captured by AMD ²	Intel ASP ³	AMD ASP ³	Annual Expected Savings ⁴	Present value of Savings (discounted at 3%) ⁵	Present Value of Savings (discounted at 6%) ⁶
Desktop	331,275	109,321	\$115	\$74	\$1,494,050	\$49,801,675	\$24,900,838
Laptop	133,350	17,336	\$182	\$68	\$658,749	\$21,958,300	\$10,979,150
Server	60,375	3,924	\$519	\$481	\$49,709	\$1,656,958	\$828,479
Total	525,000	130,581	N/A	N/A	\$2,202,508	\$73,416,933	\$36,708,467

1. Based upon numbers derived from the IDC Market Analysis, U.S. Federal Government IT Spending 2004-2007 Forecast (Updated 10-28-2005), Tables 4 and 5. Based upon this report, Federal Government purchases of IT Hardware consisted of approximately 63.1% Desktops, 25.4% Laptops, and 11.5 % Servers.
2. This column is weighted by estimates of AMD market share. The market share estimates are based on the following sources: Current Analysis' US Retail Desktop Sales by CPU Manufacturer as reported in "PCs: AMD desktops outsell Intel desktops 54% to 45%," ITfacts.biz and Current Analysis' US Retail Notebook Sales by CPU Manufacturer as reported in "AMD: Barely an Underdog," BusinessWeek, May 19, 2004. Current Analysis' figures only capture retail desktop and mobile sales, so they do not include corporate purchases or direct sales such as those by Dell. Since Dell's estimated share of the desktop market equals approximately 33% and Dell does not use AMD microprocessors, applying a 50% market share for AMD to the remaining 67% of desktop sales yields an estimate of 33% for AMD's share of microprocessor sales for desktop computers in the U.S. AMD's market share in the worldwide market for servers from IDC as reported in "AMD faces challenge of turning performance into sales," Cox News Service, May 2, 2005; IDC's 2004 US PC Shipments as reported in "Dell expands lead in still-growing PC market," CNET News.com, Jan. 18, 2005.
3. Source: Mercury 4Q04 Aggregation. Does not include monitors and keyboards.
4. Assumes a hardware refresh every three (3) years, per statements issued by the relevant branch of the armed forces.
5. Computed at the federal funds rate of 3%.
6. Computed at the present prime interest rate of 6.0%.

About the Author

My name is R. Preston McAfee. I am the J. Stanley Johnson Professor of Business, Economics and Management at the California Institute of Technology. Formerly, I was the Murray S. Johnson Professor of Economics and Chair of the Department of Economics at the University of Texas at Austin. I have previously been a Visiting Professor of Economics at the University of Chicago, the Massachusetts Institute of Technology, and the California Institute of Technology. I also have served as a professor at the University of Western Ontario. My B.A. degree, received from the University of Florida, is in economics. In addition, I hold two M.S. degrees, in economics and mathematics, from Purdue University. I received my Ph.D. degree in economics from Purdue University in 1980.

The focus of my scholarly work to date has been primarily in the field of industrial organization, particularly with regard to antitrust, pricing, bidding and auction design, and the development of markets to improve the efficiency of procurement and administration in government and the private sector. I have published more than seventy scholarly articles on these topics. I am the author of *COMPETITIVE SOLUTIONS: THE STRATEGIST'S TOOLKIT*, a leading textbook in the field of business strategy, and I am co-author with Professor John McMillan of a book entitled *INCENTIVES IN GOVERNMENT PROCUREMENT*, which uses auction theory to analyze how buyers can minimize their procurement costs. I am an associate editor of *THEORETICAL ECONOMICS*, a new open access journal, and I formerly served as co-editor of the *AMERICAN ECONOMIC REVIEW* and as an associate editor of the *JOURNAL OF ECONOMIC THEORY*. I am also a Fellow of the Econometric Society.

In addition to my academic work, I have consulted extensively for various firms and government agencies, both in the United States and abroad, on such matters as mergers, collusion, price-fixing, electricity pricing, bidding, procurement, and sales of government property. I have also testified before two Subcommittees of the United States Senate on gasoline prices and industry concentration. The U.S. Federal Trade Commission ("FTC") and Department of Justice ("DOJ") have retained me on several prior occasions. I have assisted the FTC and DOJ in evaluating the competitive implications of various mergers and antitrust cases.